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Docket No.: 218353US0

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

RE: Application Serial No.: 10/050,928
Applicants: Hiroshi KAWAI, et al.
Filing Date: January 22, 2002
For: METHOD FOR PRODUCING ETHYLENE-VINYL ALCOHOL COPOLYMER RESIN COMPOSITION
Group Art Unit: 1711
Examiner: RAJGURU, U.K.

SIR:

Attached hereto for filing are the following papers:

Appeal Brief

Our credit card payment form in the amount of **$500.00** is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R 1.136 for any necessary Extension of Time to make the filing of the attached documents timely, please charge or credit the difference to our Deposit Account No. 15-0030. Further, if these papers are not considered timely filed, then a petition is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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DOCKET NO: 218353US0

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF	:
HIROSHI KAWAI, ET AL.	: EXAMINER: RAJGURU, U. K.
SERIAL NO: 10/050,928	:
FILED: JANUARY 22, 2002	: GROUP ART UNIT: 1711
FOR: METHOD FOR PRODUCING ETHYLENE-VINYL ALCOHOL COPOLYMER RESIN COMPOSITION	:

APPEAL BRIEF

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

This is an appeal of the Final Rejection dated March 9, 2005 of Claims 1-9 and 11-16. A Notice of Appeal, along with a petition for a one-month extension of time, was timely filed on July 11, 2005.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Kuraray Co. Ltd. having an address 1621, Sakazu, Kurashiki-shi, Okayama 710-8622, Japan.

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representative and the assignee are aware of no appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF THE CLAIMS

Claims 1-9 and 11-16, all the claims in the application, stand rejected and are herein appealed.

IV. STATUS OF THE AMENDMENTS

An Amendment under 37 CFR 1.116 was timely filed on June 3, 2005, in which, *inter alia*, Claim 17 was canceled. In an Advisory Action entered June 15, 2005, the Examiner indicated that upon the filing of an appeal, the amendment will be entered. The attached Claims Appendix reflects Claims 1-9 and 11-16 as amended by the above-referenced Amendment under 37 CFR 1.116.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

As recited in sole independent Claim 1, the invention is a method for producing an ethylene-vinyl alcohol copolymer resin composition, said method comprising:

(a) introducing into an extruder an ethylene-vinyl alcohol copolymer having a water content in a range 0.5-70 wt%, based on the total weight of water and copolymer, and melting said ethylene-vinyl alcohol copolymer having a water content;

(b) further introducing into said extruder a liquid component comprising an aqueous solution of a resin, an aqueous dispersion of a resin, an aqueous dispersion of inorganic fine particles having an average diameter of not more than 10 μm, or a mixture thereof;

(c) subjecting said melted ethylene-vinyl alcohol copolymer and said component to melt-kneading in said extruder; and

(d) discharging the resulting ethylene-vinyl alcohol copolymer resin composition from the extruder.

See the specification at the paragraph bridging pages 2 and 3; page 3, lines 4-7; page 8, lines 4-5 and 21-22; page 10, lines 22-23 and 27-28; and page 19, lines 23-24, and original Claims 1 and 10.

Applicants also claim, in Claim 16, an ethylene-vinyl alcohol copolymer resin composition obtained by a method as claimed in claim 1.

VI. GROUNDS OF REJECTION

(A) Claims 1-5, 9 and 11-16 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. 5,322,866 (Mayer et al).

(B) Claims 6-8 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Mayer et al in view of JP5-39392 (Makio et al) or JP2000-43038 (Kenji et al).

(C) Claim 1 stands rejected under 35 U.S.C. § 112, second paragraph.

VII. ARGUMENT

Ground (A)

Claims 1-5, 9 and 11-16 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Mayer et al. That rejection is untenable and should not be sustained.

The present invention relates to a method for producing an ethylene-vinyl alcohol copolymer (EVOH) resin composition.

As described in the specification under "Description of the Related Art" beginning at page 1, line 8, various prior art techniques have been suggested to improve the flexibility, impact resistance, and moldability of EVOH by blending various resins therewith. Among such techniques include that disclosed in Makio et al, as described in the specification at the paragraph bridging pages 1 and 2, and in Kenji et al, as described in the specification at page 2, lines 4-9. As described therein, both Makio et al and Kenji et al employ the use of an alcohol, which is problematical.

The present invention addresses the problems of the prior art. The present invention is a **step-wise** method wherein the components of the resulting EVOH resin composition are **not** all added together. Rather, an EVOH having a particular water content is introduced into an extruder and melted (step (a)), followed by adding a liquid component, as recited (step (b)).

Mayer et al discloses a method in which unprocessed raw starch, biodegradable copolymer powder, lubricant, plasticizer, and water are continuously combined in a twin screw mixer, wherein the resulting mixture is then continuously processed into a blown film (column 2, lines 46-51), and wherein the biodegradable copolymer powder may be EVOH (column 3, line 6ff). However, Mayer et al neither discloses nor suggests adding an aqueous solution or aqueous dispersion to a melted water-containing EVOH in an extruder and mixing.

In response to the above argument, the Examiner found, in the Final Office Action, that Mayer et al's copolymer, "though in powder form, is bound to be melted very soon after it is introduced in an extruder. Additionally it is noted that according to instant claim 1, the copolymer is (a) introduced into an extruder and then (b) melted. This is what is taught by Mayer. Instant claim 1 does not require that the copolymer be melted outside (of the extruder) and then the molten copolymer introduced into the extruder."

Applicants replied that the Examiner had ignored Applicants' argument, that indeed, Mayer et al neither discloses nor suggests introducing into an extruder their components in the order specified by the present claims. While Mayer et al discloses that water is added to their blend to facilitate melting of the starch and blending with the copolymer during production (column 3, lines 41-43), Mayer et al does not recognize any benefit from any order of addition of their components. Specifically, Mayer et al does not recognize that by blending resin and/or inorganic fine particles as an aqueous solution and/or aqueous dispersion into a water-containing, melted EVOH, the resin and/or inorganic fine particles can be dispersed more uniformly than by blending as a powder, and that the blended amount can be continuously controlled more easily than is the case when blending powders, as described in the specification herein at page 3, lines 4-8. Indeed, Mayer et al does not disclose the addition of a liquid component of the type required by step (b) herein.

In the Advisory Action, in response to the above arguments, the Examiner finds "(a) changing the order of addition is an obvious variant and (b) such a change does not offer any element of patentability" to the claims.

In reply, the present invention does not involve **changing** the order of addition, but rather, setting forth an order of addition, with particular features regarding what is added at

each step. In other words, the present invention is not simply step (a) followed by step (b), whereas the prior art is step (b) followed by step (a). Even if it was, changing the order, or setting forth the order, is necessarily patentable when the prior art does not disclose or suggest either. Nevertheless, in the present invention, EVOH must have a particular water content, and be melted, prior to adding the liquid component. In Mayer et al, on the other hand, the only disclosure of an order of addition is with regard Example 1 therein, wherein a mixture of glycerol (a plasticizing agent) and water is added to a mixture of dry ingredients consisting of unprocessed raw starch, powdered EVOH, and zinc stearate (a nucleating agent), the combined mixture is stirred to yield a semi-dry powder, which powder is then fed into the extruder (column 4, lines 33-40). Thus, Mayer et al discloses nothing about EVOH **containing any amount of water**, then melting, then adding a liquid component containing a **resin or inorganic particles** thereto, since the EVOH of Mayer et al is added in dry form, and the "liquid component" is water and glycerol, which is neither a resin nor inorganic particles.

In response to Applicants' argument that the present invention results in more uniform dispersibility and easy controllability compared to blending powders, the Examiner finds, in the Advisory Action, that the present claims "are devoid of these limitations."

In reply, these properties are **inherent** properties of the claimed method; inserting them into the claims would simply make explicit what is implicit.

In the Advisory Action, the Examiner finds that Mayer et al's method "does not exclude the claimed sequential addition of materials to the extruder."

In reply, not explicitly excluding something is not the same as disclosing or suggesting it. Indeed, as discussed above, Mayer et al neither discloses nor suggests the presently-claimed method.

Claim 2

Claim 2 is separately patentable because, while Mayer et al discloses starch, it is not added in the form of an aqueous solution; rather, it is added as a powder.

Claim 3

Claim 3 is separately patentable because Mayer et al discloses no aqueous dispersion of a resin, let alone of the resins recited in this claim.

Claim 4

Claim 4 is separately patentable because Mayer et al neither discloses nor suggests either an aqueous solution or an aqueous dispersion, of starch.

Claim 5

Claim 5 is separately patentable because Mayer et al neither discloses nor suggests either an aqueous solution or an aqueous dispersion, of starch.

Claim 9

Claim 9 is separately patentable because, even though Mayer et al discloses an EVOH, the only further description thereof is as a 32% ethylene copolymer ratio (column 4,

lines 35-36) or a 38% copolymer ratio (sentence bridging columns 4 and 5), which is meaningless, since it is not clear whether the percent is weight or molar percent. Even if molar percent, Mayer et al does not disclose a saponification degree.

Claim 12

Claim 12 is separately patentable, because Mayer et al discloses and suggests nothing with regard to adjusting the water content of their EVOH in a melted state.

Claim 13

Claim 13 is separately patentable, because Mayer et al does not disclose their EVOH in a melted state *per se*, let alone within a range from 70 to 170°C.

Claim 15

Claim 15 is separately patentable, because Mayer et al neither discloses nor suggests cutting the product of their method to form pellets, let alone drying the pellets until the water content is reduced to 1 wt% or lower. Rather, Mayer et al disclose formation of films, rods, hollow tubing or other shapes with axial symmetry (column 4, lines 13-17).

Claim 16

Claim 16 is separately patentable because, given the significant differences between the presently-claimed method and that of Mayer et al, the products would also be expected to be significantly different.

For all the above reasons, it is respectfully requested that this rejection be REVERSED.

Ground (B)

Claims 6-8 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Mayer et al in view of Makio et al or Kenji et al. That rejection is untenable and should not be sustained.

The disclosures and deficiencies of Mayer et al have been discussed above. Neither Makio et al nor Kenji et al, discussed above in connection with their description in the specification herein, remedies these deficiencies. The Examiner relies on Makio et al and Kenji et al for their respective disclosures of inorganic particles. However, even if the particles of Makio et al or Kenji et al were included in the method described in Mayer et al, the result would still not be the presently-claimed invention.

For all the above reasons, it is respectfully requested that this rejection be REVERSED.

Ground (C)

Claim 1 stands rejected under 35 U.S.C. § 112, second paragraph. Since Claim 1 recites an average diameter for the recited fine particles, the rejection would appear to now be moot. Accordingly, it is respectfully requested that this rejection, if not already withdrawn, be REVERSED.

VIII. CONCLUSION

For the above reasons, it is respectfully requested that all the rejections still pending in the Final Office Action be REVERSED.

Respectfully submitted,

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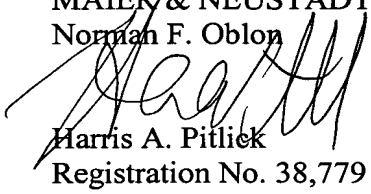

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CLAIMS APPENDIX

Claim 1: A method for producing an ethylene-vinyl alcohol copolymer resin composition, said method comprising:

(a) introducing into an extruder an ethylene-vinyl alcohol copolymer having a water content in a range 0.5-70 wt%, based on the total weight of water and copolymer, and melting said ethylene-vinyl alcohol copolymer having a water content;

(b) further introducing into said extruder a liquid component comprising an aqueous solution of a resin, an aqueous dispersion of a resin, an aqueous dispersion of inorganic fine particles having an average diameter of not more than 10 μm, or a mixture thereof;

(c) subjecting said melted ethylene-vinyl alcohol copolymer and said component to melt-kneading in said extruder; and

(d) discharging the resulting ethylene-vinyl alcohol copolymer resin composition from the extruder.

Claim 2: The method according to claim 1, wherein the liquid component is at least an aqueous solution of a resin which comprises a polyvinyl alcohol, an ethylene-vinyl alcohol copolymer, starch or a starch derivative, a cellulose derivative, a polyacrylic acid or a salt thereof, polyvinyl pyrrolidone, polyoxyethylene glycol, polyoxypropylene glycol, or a mixture thereof.

Claim 3: The method according to claim 1, wherein the liquid component is at least an aqueous dispersion of a resin which comprises a polyvinyl acetate-based emulsion, a

polyacrylic ester-based emulsion, a polyurethane-based emulsion, an ethylene-vinyl alcohol copolymer emulsion, a latex, or a mixture thereof.

Claim 4: The method according to claim 1, wherein the liquid component includes a resin, and the aqueous solution of a resin or the aqueous dispersion of a resin has a concentration of the resin component ranging from 0.5 weight % to 70 weight %.

Claim 5: The method according to claim 1, wherein the liquid component includes a resin, and the amount of the resin added per 100 weight parts of the ethylene-vinyl alcohol copolymer is in the range from 0.1 weight parts to 200 weight parts.

Claim 6: The method according to claim 1, wherein the liquid component is at least an aqueous dispersion of inorganic fine particles which has a concentration of inorganic fine particles ranging from 0.1 weight % to 50 weight %.

Claim 7: The method according to claim 1, wherein the liquid component includes inorganic fine particles, and the amount of inorganic fine particles added per 100 weight parts of the ethylene-vinyl alcohol copolymer is in the range from 0.001 weight parts to 50 weight parts.

Claim 8: The method according to claim 1, wherein the liquid component includes inorganic fine particles, and the inorganic fine particles are selected from inorganic layered compound particles, silicon oxide particles, and mixtures thereof.

Claim 9: The method according to claim 1, wherein the ethylene-vinyl alcohol copolymer has an ethylene content ranging from 3 mol% to 70 mol% and a saponification degree ranging from 80 mol% to 100 mol%.

Claim 11: The method according to claim 1, wherein the liquid component includes a resin, and the resin composition immediately after discharge from the extruder has a water content ranging from 5 weight % to 40 weight %.

Claim 12: The method according to claim 1, wherein the water content of the ethylene-vinyl alcohol copolymer in a melted state is adjusted in the extruder by feeding water to the extruder and/or removing water from the extruder.

Claim 13: The method according to claim 1, wherein the temperature of the ethylene-vinyl alcohol copolymer in the melted state is in the range from 70°C to 170°C.

Claim 14: The method according to claim 1, wherein the ethylene-vinyl alcohol copolymer resin is further kneaded in the extruder with at least one additive selected from a carboxylic acid, a boron compound, a phosphoric acid compound, an alkali metal salt and an alkaline earth metal salt.

Claim 15: A method for producing ethylene-vinyl alcohol copolymer resin composition pellets, wherein an ethylene-vinyl alcohol copolymer resin composition obtained

according to a method as claimed in claim 1 is cut to form pellets and subsequently dried until the water content is reduced to 1 weight % or lower.

Claim 16: An ethylene-vinyl alcohol copolymer resin composition obtained by a method as claimed in claim 1.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.